CURRENT LITERATURE.

Mosses and ferns.

Dr. Campbell's long continued studies upon the ferns and liverworts have prepared him admirably for the preparation of the volume on the Archegoniatæ which has recently been issued.[1] This is beyond question the most important morphological work yet published by an American botanist and the publishers have given it a dress worthy of it.

In this work Professor Campbell brings together a large amount of heretofore scattered information regarding these plants, not a little of which he has himself contributed. The first 150 pages are devoted to the Hepaticæ, less than 70 to the Musci, and 300 to the Pteridophyta. In this distribution of space the author has done wisely, giving to the polytypic liverworts a fuller discussion than the much less varied mosses, a course more necessary as the liverworts are considered by Dr. Campbell in all probability the progenitors of both mosses and ferns. While this proportion is a perfectly just one, it is also one which accords with the author's predilections and the length corresponds curiously with the strength of treatment.

It is impossible to criticise this excellent work in detail. It must suffice to say that the full and lucid account of the structure and development of archegoniate plants will be most helpful, not only to students of these groups, but also to those teachers who, because their special studies lie in other lines, need such a compendium as this to which they may turn with confidence. For the book is compendious rather than philosophical. The author seems to have avoided of set purpose any extended theoretical discussions. He has, however, given us admirable condensed statements of the affinities of the most important groups outlining divergent views when they exist. (It may be here noted in passing that by an error, apparently typographical, on p. 513, Bower's theory is misstated.)

One of the most important features of the book is that the author has been able by reason of his study of a considerable number of American species to use these in illustration of morphological points. The use of Funaria hygrometrica to illustrate the structure of the stegocarpous mosses is therefore something of a disappointment, for

[1] Campbell, D. H.—The structure and development of the mosses and ferns (Archegoniatæ). 8vo. pp. viii + 544. figs. 266. New York and London: Macmillan & Co. 1895.

this moss has been exploited until the very name is a weariness to the flesh.

Dr. Campbell has laid us under obligations further in publishing a large number of new drawings, whose freshness commends them as well as their natural look. Many of these leave nothing to be desired, especially the outline drawings, but some are really too sketchy and crude to be found in such good company. The re-drawing of illustrations from other papers is not usually well done. One would rather see Luerssen's beautiful figures of Salvinia, for instance, than these pen sketches of them.

We have more serious fault to find with the book on the score of terminology than any other. The homologies among the archegoniates are so plain and well-known that it seems a pity to continue to encumber terminology with words whose existence only emphasizes dissimilarity. Dr. Campbell adopts gametophyte and sporophyte, it is true, to designate the sexual and non-sexual stages, but he continues to use sporogonium and prothallium in a way that would be confusing to a novice. For example: "The most striking difference, then, between the sporogonium of Anthoceros and the sporophyte of the simple pteridophytes," etc., p. 513. The subheads are not only everywhere particularly illogical but also lend their aid to create confusion of ideas. For example, under the Marattiaceæ, there is a subhead, *the gametophyte*, under which the sporophyte is also described; under Isoetaceæ the subheads are the gametophyte, the embryo, the sporophyte, the sporangium.

This failure to discard obsolescent terms leads naturally to the occasional inculcation of some antiquated ideas. E. g., p. 5, "In the bryophytes, as a class, the gametophyte is more important than the sporophyte, the latter being, physiologically, merely a spore-fruit . . ." This is very questionable from the physiologists' standpoint and the less said about such analogies in morphological treatises the better.

If we may now express regret that the author did not provide a good index—something more than a mere register of names—our unwelcome task of pointing out the few blemishes in a most praiseworthy book shall be concluded.

The soil.

Since land plants are so largely influenced in form and function by the soil a book upon the physics of the soil has great interest for botanists, and all the more when the subject is treated from the point of view of the agriculturist. Professor King's researches at the Univer-

sity of Wisconsin upon the soil water have led him to a general study of soil physics and at Professor Bailey's suggestion he has prepared this book as the first volume of a "Rural Science Series" (L. H. Bailey, editor, issued by Macmillan & Co.) which is to be an authoritative series of readable monographs treating rural problems in the light of underlying principles. It is particularly appropriate that the initial volume of the series[1] should discuss the soil, upon which most "rural problems" depend.

The book treats concisely and interestingly the nature, functions, origin, texture, composition, and kinds of soil; nitrogen of the soil; the distribution of roots; relation of air and water to soil; temperature; drainage and irrigation; and the physical effects of tillage and fertilizers. In most of these chapters there is much to interest the physiologist and the book may be commended as a necessity for the library.

Minor Notices.

JUST'S BOTANISCHER JAHRESBERICHT is so well known that it seems scarcely necessary to call attention to its value. The twentieth volume has recently been completed.[2] This Annual Report endeavors to give reviews every year of all botanical works, treating bacteriology and pharmacy only so far as these are of general interest to botanists. In producing this invaluable work of reference Dr. E. Koehne, the editor, is aided by several well known specialists. By giving abstracts hereafter in a more concise form, the Annual Report is to be reduced both in price and size. The completeness of this work is a consideration of so much importance for all botanists that the editor earnestly requests botanists in all countries to send him separates of all papers, especially of such as are not likely otherwise to be referred to in the Annual Report. Such contributions would permit more prompt publication and justify more reliance upon the Report. It is particularly requested to send everything to the editor's adddress: Professor Dr. E. Koehne, Friedenau-Berlin, Kirchstr. 5, Germany.

AN ANNOTATED LIST of the aquatic phanerogams of Iowa has been distributed by Mr. R. I. Cratty[3] as a separate from the science bulletin of the State University of Iowa. It embraces eighteen genera and

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[1] King, F. H.—The soil; its nature, relations, and fundamental principles of management. 12mo. pp. xvi + 303. figs. 45. New York: Macmillan & Co. 1895. $0.75.

[2] Koehne, E.:—Just's botanischer Jahresbericht, systematisch geordnetes Repertorium der botanischen Literatur aller Länder. Berlin W., am Karlsbad 15. Gebrüder Borntraeger. Jährlich 40 m.

[3] Cratty, R. I.—Notes on the aquatic phenogams of Iowa. Extracted from Bulletin Lab. Nat. Sci. State Univ. Iowa **3**: 136–152. Dec. 16, 1895.

forty-one species. Nine species are added to the state flora as heretofore listed in Arthur's "Contributions to the flora of Iowa" and Hitchcock's "Catalogue of the Anthophyta and Pteridophyta of Ames." They are the following: *Echinodorus rostratus* Engelm., *Lophotocarpus calycinus* (Engelm.) J. G. Smith, *Potamogeton heterophyllus* Schreb., *P. major* Morong, *P. Nuttallii* C. & S., *P. pusillus* L., *P. spirillus* Tuck., *Sagittaria Arifolia* Nutt., and *Wolffia brasiliensis* Wedd. It is a most excellent piece of local botanical work. The data are very full and so critically considered that they can be taken as authoritative. Local lists of this kind are most welcome, and their number should increase.

A CHARMING little book is that Professor W. W. Bailey has written about Rhode Island wild flowers.[1] It has the breath of the woods about it, especially as we follow the author to the "favored spots" where grow the floral prizes. Like the trumpet to the war horse, the book stirs us and arouses the desire to wander afield again and gather the treasures which used to awaken our earlier enthusiasm. With the entertaining chapters go some of scientific value which record Rhode Island ferns and trees; but the book is primarily for the nature lover.

A MOST COMMENDABLE and serviceable work has just been published on the bibliography of Italian botany by Prof. P. A. Saccardo.[2] Brief biographical items and the titles of chief works of 1434 Italian and 287 foreign writers on the botany of the country are given. Whatever has been anticipated in Pritzel's *Thesaurus* is referred to and not duplicated. The work also includes notes on all public, private and educational botanic gardens, of which the number is surprisingly large, including a list of their publications. Some other matters also find place.

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[1] Bailey, W. W.—Among Rhode Island wild flowers. 12mo. pp. xii + 105, pl. 3. Providence: Preston & Rounds. 1895.

[2] Saccardo. P. A.—La botanica in Italia; materiali per la storia di questa scienza. 4to. pp. 236. Venezia, 1895. 10 fr.